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(71) Applicant  
**Hadley Industries PLC**  
(Incorporated in the United Kingdom)

P.O. Box 92, Downing Street, Smithwick, Warley,  
West Midlands, B66 2PA, United Kingdom

(72) Inventor  
**Geoffrey Thomas Deeley**

(74) Agent and/or Address for Service  
**Forrester Ketley & Co**  
Chamberlain House, Paradise Place, Birmingham,  
B3 3HP, United Kingdom

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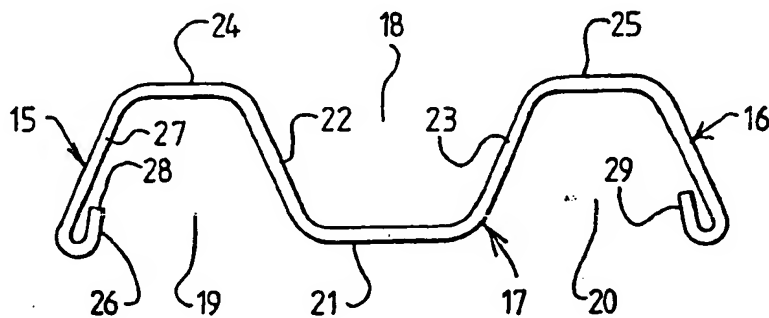
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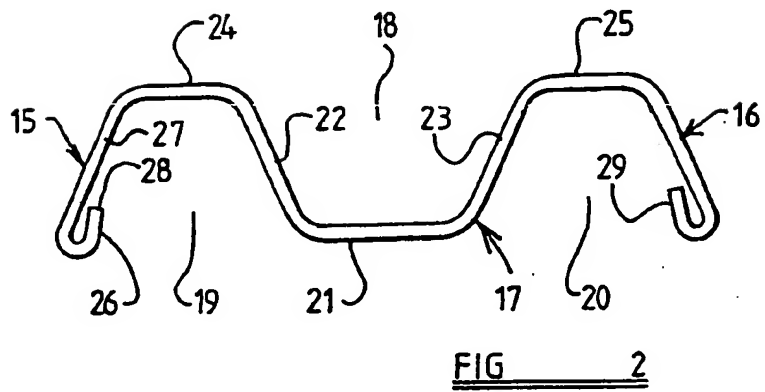
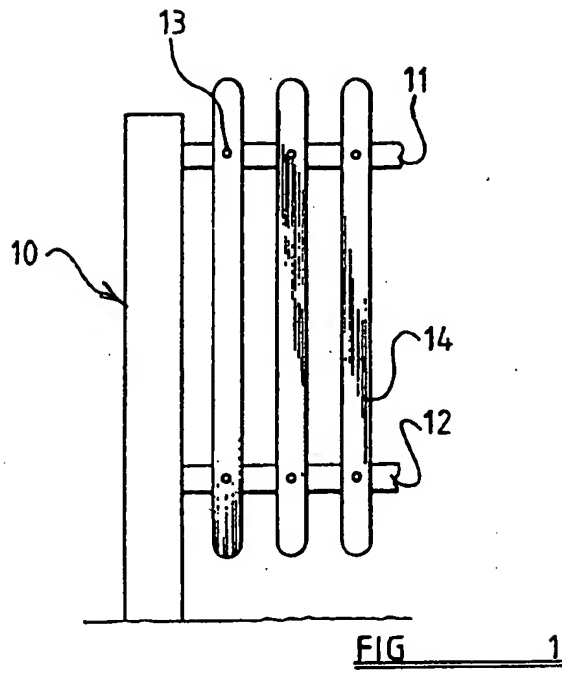
(54) Fence pale and method of making same

(57) A fence pale formed from slit, pre-galvanised steel strip has its ungalvanised edges (28) lying adjacent to galvanised surfaces (27).



**FIG 2**

**GB 2 249 327 A**



Title: Fence pale and method of making same

**Description of Invention**

The present invention relates to fencing of the kind comprising a plurality of rails which extend between posts or other supports and a plurality of pales secured to the rails. By a pale, we mean an elongated member which, when incorporated in the fence, is arranged with its length transverse to the rails and is secured to at least two of the rails.

It is known to make fence pales from steel strip and to galvanise the pales, to inhibit corrosion. The step of galvanising manufactured pales is expensive and the surface finish achieved is inferior to the surface finish which can be achieved by the use of strip galvanised prior to roll forming, which is usually called pre-galvanised strip.

It is known to galvanise steel strip which is then coiled for storage and distribution to a point of use. In some cases, the galvanised strip can be used to form articles which do not require further protection. However, in the case of fence pales, it is recognised that slitting of galvanised strip into widths suitable for forming fence pales and then forming the widths into fence pales of known shape, for example by cold roll-forming, leaves exposed, ungalvanised edges formed during the slitting operation and that the fence pale may corrode excessively at these edges so that the appearance of the pale will eventually be unsatisfactory, if the pale is exposed to the weather.

We have found that unsatisfactory deterioration of the appearance of a fence pale formed from pre-galvanised steel strip without subsequent galvanising can be avoided by taking advantage of sacrificial action of the zinc coating present on the pale.

According to a first aspect of the present invention, there is provided a fence pale formed of galvanised steel strip and having over at least a major part of its length a transverse cross section which includes opposite side walls between which there is at least one channel, wherein each side wall has a first surface facing away from the remainder of the pale, a second surface opposite to

the first surface and an inturned lip with an ungalvanised edge, the edge lying sufficiently close to the second surface to benefit from sacrificial action of the zinc coating on the second surface.

In a fence pale embodying the invention, the ungalvanised edge may be in contact with the second surface or may be spaced slightly from that surface, provided that the ungalvanised edge is sufficiently close to the second surface, as aforesaid.

According to a second aspect of the invention, there is provided a method of manufacturing a fence pale from steel strip comprising the steps of galvanising the strip, slitting the strip longitudinally into a number of pieces and passing one of said pieces through a set of forming rolls which impart to the piece of strip a transverse cross section as hereinbefore defined, an edge formed during the step of slitting the strip constituting said ungalvanised edge.

An example of a fence embodying a pale according to the present invention and which is manufactured by a method according to the second aspect of the invention will now be described, with reference to the accompanying drawings, wherein:

FIGURE 1 shows a part of the fence and

FIGURE 2 shows, on an enlarged scale, a transverse cross section through a pale of the fence.

The fence comprises a number of vertical posts, one of which is indicated at 10. Between adjacent posts, there extend upper and lower, horizontal rails 11 and 12. A number of pales is arranged in a row between adjacent posts. In the example illustrated, the pales are vertical and are spaced from each other. Each pale is secured to the rail 11 and to the rail 12 by suitable fasteners, one of which is represented at 13. The pales may be identical with each other and one of these, identified by the reference number 14, will be described in detail.

Over at least a part of its length, the pale 14 has a cross section as shown in Figure 2. This includes a side wall 15 at one lateral margin of the pale and a side wall 16 at the opposite lateral margin. Between the side walls 15 and 16, the pale includes an intermediate portion 17 which defines a channel 18

having an open mouth which faces away from the rails 11 and 12. The intermediate portion and the side wall 15 collectively define a channel 19 which has an open mouth facing towards the rails. The side wall 16 and the intermediate portion 17 collectively define a further channel 20 which also has an open mouth facing towards the rails.

As illustrated in Figure 2, the intermediate portion 17 of the transverse cross section of the pale may include a central, substantially flat web 21, further substantially flat webs 22 and 23 which lie at opposite sides of the channel 18 and which are inclined to the web 21 at an obtuse angle, a substantially flat web 24 which extends between the web 22 and the side wall 15 and which is parallel to the web 21 and a further flat web 25 which is parallel to the web 21 and which extends between the web 23 and the side wall 16. In the example illustrated, the side wall 15 is inclined at an obtuse angle to the web 24 and the side wall 16 is inclined at the same obtuse angle to the web 25.

At the margin of the side wall 15 which is remote from the web 24, there is an inturned lip 26 which overlies a part of a surface 27 of the side wall 15 which faces generally towards the web 22 across the channel 19. The free edge 28 of the lip 26 lies close to the surface 27. The gap between the lip 26 and the side wall 15 is generally of tapered shape, being narrower adjacent to the edge 28 and wider where the lip joins the side wall. The maximum width of this gap does not exceed the extent of the lip 26 from the edge 28 to the position where the lip joins the side wall.

The side wall 16 has a lip 29 corresponding to the lip 26 on the side wall 15.

The pale 14 is formed from galvanised steel strip. The strip is galvanised during manufacture and is subsequently coiled, in order that the strip can be stored and transported conveniently. When the strip is to be used to form a number of pales, the strip is unwound from the coil and is slit longitudinally into a number of pieces. The width of each of these pieces depends upon the cross sectional dimensions of the pale. It will be understood that slitting of the strip produces ungalvanised edges on the pieces of strip.

A piece of strip which has been slit to the required width is then passed through a set of cold-forming rolls which progressively form the cross sectional shape illustrated in Figure 2. It will be noted that, during this operation, the ungalvanised edges are moved into respective positions adjacent to inwardly facing surfaces of the side walls of the pale. Typically, a piece of strip having a length many times that of a single pale is rolled to the cross section shown in Figure 2 and is then cut into lengths corresponding to single pales. The shapes of the ends of the pales may be the same as the shapes of the ends of known pales. If required, a portion of each pale may be slit longitudinally and bent to provide divergent spikes. Scrap material may be cut away to form the required shapes at the end of the pales.

Over at least a major part of the length of the finished pale, the cross sectional shape is as shown in Figure 2. The ungalvanised edge 28 is either in contact with the surface 27 of the side wall 15 or is sufficiently close thereto to benefit from sacrificial action of the zinc layer on the surface 27. Accordingly, sacrificial action reduces corrosion of the steel at the ungalvanised edge 28, as compared with the corrosion which would occur if this edge was formed directly at a margin of the side wall 15.

The thickness of the strip from which the pale 14 is formed is typically within the range 1mm to 2mm. The extent of the lip 26 from the position where it joins the side wall 15 to the edge 28 preferably exceeds the thickness of the strip and may be a plurality of times greater than the thickness of the strip. The distance between the edge 28 and the surface 27 is preferably less than the thickness of the strip. It will be understood that the thickness of the material is not changed significantly by the cold roll-forming operation.

We have found that the performance of a pale as hereinbefore described, with ungalvanised edges on the lips is similar to that of post galvanised steel pales, the pales in each case not being painted. The life of the pales can be further extended by painting.

Whilst the example of pale illustrated in the accompanying drawing has substantially flat side walls and substantially flat webs, there may be formed

in one or more of these longitudinally extending ribs, if greater stiffness of the pale is required. Such ribs can be formed in the roll-forming operation.

The features disclosed in the foregoing description, or the following claims, or the accompanying drawings, expressed in their specific forms or in terms of a means for performing the disclosed function, or a method or process for attaining the disclosed result, as appropriate, may, separately or in any combination of such features, be utilised for realising the invention in diverse forms thereof.

**CLAIMS**

1.       A fence pale formed of galvanised steel strip and having over at least a major part of its length a transverse cross section which includes opposite side walls between which there is at least one channel, wherein each said side wall has a first surface facing away from the remainder of the pale, a second surface opposite to the first surface and an inturned lip with an ungalvanised edge, the edge lying sufficiently close to the second surface to benefit from sacrificial action of the zinc coating on the second surface.
2.       A pale according to Claim 1 wherein said ungalvanised edge is spaced from opposite margins of the second surface by distances, both of which exceed the thickness of the side wall.
3.       A fence incorporating a plurality of pales as defined in Claim 1 or in Claim 2.
4.       A method of manufacturing a fence pale from steel strip comprising the steps of galvanising the strip, slitting the strip longitudinally into a number of pieces and passing one of said pieces through a set of forming rolls which imparts to the piece of strip a transverse cross section which includes opposite side walls between which there is at least one channel and wherein each side wall has a first surface facing away from the remainder of the pale, a second surface opposite to the first surface and an inturned lip with an ungalvanised edge formed during the slitting step, said edge lying close to or at the second surface of the side wall.
5.       A fence pale substantially as hereindescribed with reference to the accompanying drawing.



-7-

**Patents Act 1977**  
**Examiner's report to the Comptroller under**  
**Section 17 (The Search Report)**

Application number

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**Relevant Technical fields**

(i) UK CI (Edition K ) E1D(DLCKH, DLCKK, DLCHH, DLCKN,  
DCF)

(ii) Int CI (Edition 5 ) E04H

**Search Examiner**

D J LOVELL

**Databases (see over)**

(i) UK Patent Office

(ii) ONLINE DATABASE-DERWENT WPI

**Date of Search**

13 JANUARY 1992

Documents considered relevant following a search in respect of claims

1-5

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
	NONE	

Category	Identity of document and relevant passages - 8 -	Relevant to claim(s)

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